NON-PUBLIC?: N
ACCESSION #: 8908280268
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Vogtle Electric Generating Plant - Unit 2 PAGE: 1 of 5

DOCKET NUMBER: 05000425

TITLE: FAILURE OF PRESSURE CHANNEL CIRCUIT CARD CAUSES REACTOR TRIP
EVENT DATE: 07/26/89 LER #: 89-024-00 REPORT DATE: 08/21/89

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: R. M. ODOM, NUCLEAR SAFETY AND COMPLIANCE

TELEPHONE: (404) 826-3201

COMPONENT FAILURE DESCRIPTION:
CAUSE: B SYSTEM: JC COMPONENT: AMP MANUFACTURER: W120
REPORTABLE NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On 7-26-89, at 0136 CDT, while personnel were performing corrective maintenance on power range nuclear instrumentation channel 2N43, a 2 out of 4 overtemperature delta-T (OTDT) trip signal was received and caused an automatic reactor trip for VEGP Unit 2. The corrective maintenance on 2N43 required the channel III OTDT reactor trip bistable to be tripped as a part of the removal from service process. A loss of input from pressurizer pressure channel 2P458 then occurred and caused the channel IV OTDT reactor trip bistable to trip. This completed the 2 out of 4 logic required for reactor trip on OTDT. By 0156 CDT, the plant had been stabilized in Mode 3.

The failure of channel 2P458 was caused by the failure of an operational amplifier in the non-isolated section of an NLP2 process card. This channel had spiked low on two separate occasions several days earlier but troubleshooting failed to identify the exact cause of the problem until

after the reactor trip. An additional spiking problem had also been experienced on channel 2N43 and was still being investigated at the time of the event.

Corrective action consisted of replacing the defective NLP2 card for channel 2P458 and replacing a suspect card for channel 2N43.

END OF ABSTRACT

A. REQUIREMENT FOR REPORT

This report is required per 10 CFR 50.73(a)(2)(iv) because the event resulted in an unplanned automatic actuation of the Reactor Protection System.

B. UNIT STATUS AT TIME OF EVENT

At the time of the event Unit 2 was in Mode 1 (Power Operation) at 100% of rated thermal power. Power range nuclear instrumentation channel 2N43 was out of service for corrective maintenance. Additionally, a strip chart recorder had previously been installed on pressurizer pressure channel 2P458 for monitoring purposes.

C. DESCRIPTION OF EVENT

On 7-26-89, at 0136 CDT, an automatic reactor trip occurred for Unit 2 due to receipt of an overtemperature delta-T (OTDT) trip signal. dust prior to the trip, at 0134 CDT, the channel III power range nuclear instrumentation channel (2N43) had been removed from service to allow replacement of the high range overpower trip bistable card for that channel. As a part of the removal from service process several bistables were tripped, including the channel III OTDT trip bistable. At 0136 CDT, pressurizer pressure channel IV (2P458) failed low causing several bistables to trip, including the channel IV OTDT trip bistable. Because the channel III and channel IV OTDT bistables were then tripped, the required 2 out of 4 logic for a reactor trip on OTDT was satisfied.

Following the reactor trip, both motor driven auxiliary feedwater (AFW) pumps and the turbine driven AFW pump started as expected on steam generator (SG) low-low level. At 0147 CDT, a digital rod position indication (DRPI) data B failure alarm occurred for rod E-13 of shutdown bank D and cleared at 0149 CDT. (Note: a data B failure alarm indicates that data from the detector/encoder card in data cabinet B is in question). By 0156 CDT, the plant was stabilized in Mode 3 and the

emergency operating procedures were exited and unit operating procedure 12006-C, "Unit Cooldown to Cold Shutdown" was entered.

D. CAUSE OF EVENT

An investigation by Instrumentation and Controls (I&C) personnel revealed that the root cause of this event was the failure of an NLP2 process card (card 2PQY-458) in the 2P458 pressurizer pressure channel. An operational amplifier (W56-1-J) was verified as having failed in the non-isolated section of the card, causing the non-isolated output of the NLP2 card to go to zero volts DC. This represented a 1700 psig signal to the low pressure reactor trip and low pressure safety injection bistables, and caused the bistables to trip. This also represented a 1700 psig signal to the channel IV OTDT setpoint calculator, thus causing the setpoint to be significantly reduced below normal 100% power operating parameters which caused the OTDT reactor trip bistable to trip. Because the channel III OTDT reactor trip bistable had already been tripped due to the corrective maintenance being performed on power range channel 2N43, the 2 out of 4 logic for a reactor trip on OTDT was satisfied.

A contributing cause of this event was the fact that spiking problems had been experienced on both the 2N43 power range channel and the 2P458 pressurizer pressure channel prior to the reactor trip.

On 7-7-89, power range channel 2N43 experienced spiking problems causing the overpower reactor trip bistable to trip and an alert alarm to annunciate. Troubleshooting of the 2N43 channel was performed by I&C personnel and a strip chart recorder was installed. However, the exact cause of the problem was not identified. The overpower trip bistable card was subsequently identified as a possible cause and an attempt was made to replace this card on 7-26-89.

On 7-19-89 and 7-20-89, spiking problems were also experienced for pressurizer pressure channel 2P458, causing several bistables to trip and alert alarms to annunciate. Troubleshooting and installation of a strip chart recorder for this channel similarly failed to identify the exact cause of the problem. However, the NLP2 card was identified as a possible cause prior to the reactor trip. Since it was suspected as being defective, the NLP2 card was scheduled for replacement on 7-27-89. The spiking problem for channel 2P458, which had not occurred in over five days, reoccurred shortly after taking power range channel 2N43 out of service and caused the reactor trip.

The cause for the DRPI failure following the reactor trip has been attributed to a momentary loss of rod position information and no further corrective action is required.

E. ANALYSIS OF EVENT

The reactor tripped as designed on the coincidental trip of the channel III and channel IV OTDT reactor trip bistables. The control rods fully inserted into the core and the steam dumps and the steam generator (SG) atmospheric relief valves functioned properly to relieve SG pressure and reduce reactor coolant T-avg. Main feedwater isolation occurred and AFW actuation took place, as expected, to maintain SG water levels. Based on these considerations, it is concluded that there was no adverse affect on plant safety or the health and safety of the public

F. CORRECTIVE ACTIONS

1. The defective NLP2 card for pressurizer pressure channel 2P458 was replaced. The overpower trip bistable card for power range channel 2N43 was also replaced although it has not been verified that this card was defective.

2. Calibrations and surveillances were completed for the appropriate reactor protection channels prior to returning the Unit 2 reactor to power.

3. The removed process cards have been returned to Westinghouse for repair.

4. Westinghouse was contacted and verified that no generic concern with the application or failure rate of operational amplifiers (Op-Amps) similar to the one that was verified as having failed on the NLP2 card existed.

G. ADDITIONAL INFORMATION

1. Failed Components

Westinghouse 7300 System Process Card

Type: NLP2

Part No: 2837A12G02

Operational Amplifier W56-1-J Part No. 669A692H01

2. Similar Previous Event

On 5-12-89, VEGP Unit 2 experienced a similar reactor trip when a rate trip bistable actuated for power range channel 2N43 while channel 2N44 was removed from service for surveillance purposes. However, in that event the cause for the momentary loss of power that caused the 2N43 rate trip bistable to actuate could not be determined. The 5-12-89 event was reported by LER 50-425/89-020.

3. Energy Industry Identification System Codes

Plant Protection System - JC

Georgia Power Company
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Atlanta, Georgia 30308
Telephone 404 526-3195

Mailing Address
40 Inverness Center Parkway
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ELV-00780
W. G. Hairston, III 1578n
Senior Vice President
Nuclear Operations

August 21, 1989

Docket No. 50-425

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Gentlemen:

VOGTLE ELECTRIC GENERATING PLANT

LICENSEE EVENT REPORT
FAILURE OF PRESSURE CHANNEL CIRCUIT
CARD CAUSES REACTOR TRIP

In accordance with 10 CFR 50.73, Georgia Power Company hereby submits the enclosed report related to an event which occurred on July 26, 1989.

Sincerely,

W. G. Hairston, III

WGH,III/NJS/gm

Enclosure: LER 50-425/1989-024

xc: Georgia Power Company
Mr. C. K. McCoy
Mr. G. Bockhold, Jr.
Mr. R. M. Odom
Mr. P. D. Rushton
NORMS

U. S. Nuclear Regulatory Commission
Mr. S. D. Ebneter, Regional Administrator
Mr. J. B. Hopkins, Licensing Project Manager, NRR
Mr. J. F. Rogge, Senior Resident Inspector, Vogtle

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